ing at the microscope and the partial exclusion of air from the preparation. Figures are given of these plastids and of the bacteria. All of which reminds us of the proof of miraculous healing by holy water at certain wells, viz., " the well is with us to this day." The author complains that nobody reads his books, but this cannot be charged against the writer who has patiently waded through the whole of this one, to very little profit, however, it must be confessed. The absurdities, however, are not so numerous as in the author's *Phytopathology*, published in 1868. Therein may be found, full fledged or in embryo, most of the queer notions here set forth and also many others.

ERWIN F. SMITH.

ZOOLOGY.

The Cruise of the Princess Alice.—The zoological material obtained by the Prince of Monaco during the past summer cruise of his yacht, the Princess Alice, is abundant and valuable. The fortunate capture of a sperm whale in the vicinity of the yacht, off the coast of Terceira Island, resulted in the acquisition of some rare specimens of the animal kingdom which otherwise might never have been known. From the Prince's narrative of the voyage we learn that the cachalot was the " catch " of some Portugese whalers with whom the Prince arranged to secure what portions of the animal he wished, especially the brain. Unfortunately some days elapsed before the skull was penetrated, and then the brain was found to be in too advanced a stage of decomposition to be of use for preservation. Meantime a large number a parasites were collected from the stomach, the digestive organs, the blubber and the skin of the animal, and the contents of the stomach secured for examination. While in the act of death the whale ejected several large cephalopods which it had only just swallowed, as was evident from their perfect preservation. These were also obtained by the Prince for his collection. Amongst them were three large specimens, each over one meter in length, of a species probably new, of the little-known genus Histioteuthis; also the bodies of two other immense cephalopods so different from all hitherto known that it is impossible to place them in any genus or even family of this order. M. Jonbain proposes for them the name *Lepidoteuthis grimaldii*. One of these specimens is a female, of which the body, or visceral sac after prolonged immersion in formol and alcohol, still measures 90 cm. in length, from which it is

estimated that the length of the complete animal would exceed 2 meters. The surface of the sac is covered with large, solid rhomboidal scales, like those of a pine cone. The fin is very powerful, forms one-half of the length of the body and is not furnished with scales.

When the stomach of the whale was opened it was found to contain over a hundred kilogrammes of partially digested debris of cephalopods, all of them of enormous size. The crown and tentacles of a Cucioteuthis were identified. This genus has hitherto been known only by few fragments. The muscular arms, though shrunken and contracted by the preserving fluid, are as thick as those of a man, were covered with great suckers, each armed with a sharp claw, as powerful as those of the larger carnivora. More than one hundred of these suckers remain adhering to the arms.

Another cephalopod found in the stomach of the whale is provided with a large fin, in the skin of which are enclosed certain photogenic organs. The form of the body suggests a new species, but as the head is wanting, it cannot be positively identified.

These cephalopods are all powerful swimmers, and very muscular. They appear to belong to the fauna of the deep intermediate waters, an almost unknown region. They never come to the surface, no do they lie on the bottom of the sea. Their great agility prevents their capture in nets, hence it would seem that the only way to obtain these interesting gigantic creatures is to kill the giant who feeds upom them and rescue the fragments from his huge maw.

Accordingly, for the next season's cruise, the Princess Alice is to have, in addition to her present fittings, those of a sperm whaler, or else to have as a compainion a special whaling tender.

The further working up of the material in hand is being pushed forward with energy, and interesting results are anticipated. (Nature, Jan., 1896.)

Australian Spiders.—Among the new Arachnida reported from New South Wales are three species of Nephila; *N. fletcherii*, *N. edwardsii* and *ventricosa*. These are described and figured by Mr. W. J. Rainbow in the Proceeds. of the Linn. Soc. N. South Wales. The author includes in his paper some interesting observations on the habits of Nephilæ and their supposed bird-snaring propensities. Representatives of this genus abound in tropical and subtropical regions. Their webs are composed of two kinds of silk; one yellow, exceedingly viscid and elastic, the other white, dry and somewhat brittle. The latter is used for the framework of the web, the guys and radii, and the former

for the concentric rings. These snares are at varying heights, sometimes within reach, again 10 to 12 feet from the ground, but always in a position exposed to the rays of the sun. The diameter is also variable, from 3 feet upwards. One seen by Gräffe in the Fiji Islands (probably a Nephila) constructs a web 30 feet in diameter.

These snares are strong enough to entrap small birds. In the author's opinion the web is not set for such game, and the spider does not feed on her ornithological victim. In the cases where she has been observed with her fangs in the body of the ensnared bird it is probable that it is for the purpose of hastening the death of the bird in order to prevent its injuring the web in its struggles to escape.

Spiders of the genus Nephila are easily tamed. Although exceedingly voracious, they can nevertheless exist for many days without either food or water. They pair in autumn. The sexes inhabit the same web for a considerable time, the female in the center and the male on the upper edge of the web. His efforts to ingratiate himself in the favor of his mate are not always successful. It not infrequently happens that he has to retire from her presence minus two or three legs. "Ultimately says the author, he succeeds in attaching himself in the requisite position, and performing the necessary act of fecundation." (Proceeds. Linn. Soc. N. South Wales, [2] Vol. X, Pt. 2, 1895.)

Autodax iëcanus.—According to Mr. Van Denburg, *Autodax iëcanus*, a black Salmander first found in Shasta Co., California, is a nocturnal forager. It usually walks slowly along, moving one foot at a time, but is capable of rapid motion when necessary. At such a time it aids the action of the legs by a sinuous motion of the whole body and tail. In addition to being prehensile, the tail is put to a third use. When caught the animal will often remain motionless, but if touched will raise the tail and strike it forcibly against the surface upon which it rests, and accompanying this action with a quick motion of the hind legs, will jump from four to six inches, rising as high as two or three inches. Mr. Van Denburg finds that the species has a wide distribution in California. (Proceeds. Calif. Acad. Sci., Vol. V, 1895.)

Reptiles and Batrachians of Mesilla Valley, New Mexico.—The following list may be worth publishing as a contribution to the more exact knowledge of the distribution of animals in New Mexico. It may be relied upon as correct, as all the species have been identified by Dr. L. Stejneger, and the specimens are to be found in the U. S. National Museum. The valley about Las Cruces, where most of the species were obtained, is 3800 ft. above sea-level, its extreme sides rise

to about 5000 ft. The records marked Lane Coll. are based on specimens obtained by Mr. Lane of Las Cruces, mainly by purchase from the Mexicans.

(1.)* *Bufo lentiginosus* v. *woodhousei.* Common about the town.

(2.) *Rana pipiens* v. *brachycephala.* Common in suitable places.

(3.) *Amblystoma tigrinum.* Not rare about the town. A large specimen found by Mr. J. Schmidt.

(4.) *Cistudo ornatus.* Common about the town.

(5.) *Sistrurus edwardsii.* Close to the College building.

(6.) *Heterodon nasicus.* Close to the College, rather common.

(7.) *Coluber emoryi.* One near Las Cruces, April, 1894 (J. M. Walker).

(8.) *Pituophis sayi.* Our commonest snake. One specimen had the head-scales arranged as in the so-called genus *Churchillia.*

(9.) *Bascanion testaceum.* One specimen.

(10.) *Thamnophis dorsalis.* Frequent, the commonest snake after *Pituophis.*

(11.) *Lampropeltis pyrrhomelas.* H. B. Lane Coll.

(12.) *Lampropeltis splendida.* Lane Coll.

(13.) *Diadophis regalis.* Lane Coll.

(14.) *Arizona elegans.* Lane Coll.

(15.) *Rhinocheilus lecontei.* Lane Coll.

(16.) *Liopeltis vernalis.* Lane Coll.

(17.) *Tantilla nigriceps.* Lane Coll.

(18.) *Leptotyphlops dulcis.* Lane Coll., also one obtained by Prof. C. H. T. Townsend.

(19.) *Eumeces obsoletus.* Not rare near the College.

(20.) *Cnemidophorus tessellatus.* Common about the mesquites bushes.

(21.) *Cnemidophorus perplexus.* Lane Coll.

(22.)* *Sceloporus magister.* One in Coll. Exp. Sta., one in Lane Coll.

(23.)* *Uta stansburiana.* Our commonest lizard, abundant on the college campus.

(24.)* *Crotaphytus wislizenii.* One. Remains of beetles in stomach.

(25.)* *Crotaphytus baileyi.* Apparently not uncommon. One had two young *Phrynosoma modestum* in its stomach.

(26.) *Phrynosoma cornutum.* Common. At Lamy and Santa Fé it is replaced by *P. hernandezii,* which in the neighborhood by Santa Fé ascends to 7475 ft.

(27.) *Phrynosoma modestum*. Common. There also occurs a bluish mutation.

The Death Valley Expedition, much further west, obtained 56 reptiles and batrachians, of which only five (those marked with an asterisk) are common to our list. It is especially noteworthy that there is not a single snake in common.

—T. D. A. COCKERELL, N. M. Agr. Exp. Sta.

Professor Cope's criticisms of my drawings of the squamosal region of Conolophus subcristatus Gray; (Amer. Natural., Febr., 1896, p. 148–149) and a few remarks about his drawings of the same object from Steindachner.—In the February Number of this Journal Prof. Cope makes the following remarks: "Dr. Baur again denies that the exoccipital [paroccipital] articulates with the quadrate in certain genera of the Iguanidæ and gives some figures of that region in the *Conolophus suberistatus*, to sustain his allegation. Unfortunately, though he seems to have taken the elements apart, as I suggested that he do, he did not put them together in their original relation when he had them drawn. I now give two drawings traced from the skull of the same species given by Dr. Steindachner. As these plates represent exactly the characters, which I have observed and described in allied genera, I regard them as correct. It will be observed that there is a considerable contact between the exoccipital and the quadrate. There is also contact with the supratemporal [prosqamosal] and probably with the paroccipital [squamosal]. *The articulation of the quadrate with the exoccipital is universal in the Iguanidæ.*"

To this I have to reply the following: 1. The single elements of the skull of Conolophus were not taken apart at all. The quadrate, prosquamosal, and squamosal of the right side were separated from the rest of the skull, in such a way, that they remained together in natural position. The corresponding left side of the skull remained intact. All this was done two years ago, without the advice of Prof. Cope. My figures were drawn with the camera-lucida and are absolutely correct in every respect. I have two other skulls of Conolophus; several of Amblyrhynchus, Iguana and Cyclura. In all I find the same condition. I have not to change a single word in my original description nor a line in my drawings. The quadrate is not supported by the par occipital [exoccipital Cope] in the Lizards, as Cope stated, but by the squamosal [paroccipital Cope], the prosquamosal [supratemporal Cope] taking also part, if present. The paroccipital does not even touch the quadrate.

2. I know the drawings of Steindachner very well. These drawings, however, have not been made, to show the detailed relations of the different elements of the skull. Especially the regions copied by Cope are drawn quite insufficiently. The sutures between the different elements cannot be made out.

Prof. Cope's drawings are not exact tracings from Steindachner for he has drawn sutures, which do not exist at all in Steindachner's figures. There is no such suture, as he figures between the postorbital (Pob.) and his supratemporal (St.), in the actual specimen, nor in Steindachner's drawing. The real suture between these two elements, crosses Cope's alleged suture at right angles, as can be seen in any of the skulls of the Ignanidæ. In Prof. Cope's figure the outer and upper portion of the distal end of the paroccipital process separates the parietal process from the prosquamosal (supratemporal, Cope). This is not the case; the parietal process is always united with the prosquamosal above the distal end of the paroccipital. The squamosal (paroccipital, Cope) is also drawn quite incorrect; besides its true relations can not be made out at all from Steindachner's figures, which are quite useless in this respect.

Prof. Cope really believes now, that the element in the Testudines called by Cuvier "*occipital extérieure*"; by Owen "*paroccipital*," by Huxley "*opisthotic*" consists of *two* elements, and this he simply does, in order to hold his absolutely unfounded idea of the homology of the squamosal of the Squamata with the paroccipital of the Testudines. The paroccipital is a single element which, in all Reptilia known, lodges in front the posterior semicircular canals. It is free from the exoccipital in the Ichthyosauria, Testudines, and young Rhynchocephalia, it is united with the exoccipital in the whole Archosaurian branch of Reptiles containing the Crocodilia, Phytosauria, Aetosauria, Megalosauria, Iguanodontia, Cetiosauria, Pterosauria; it is also united with the exoccipital in the Plesiosauria and Squamata. It is a fact, that the exoccipital plus paroccipital of the Ichthyosauria, Testudines, and the young Sphenodon are homologue to the exoccipital plus united paroccipital in the Squamata and other Reptilia. In the first case the paroccipital is free from the exoccipital either during the whole life, or during the younger stages, in the second case it becomes very early united with the exoccipital. The paroccipital portion of the exoccipital of the adult Sphenodon is homologous to the paroccipital portion of the exoccipital in the Squamata, and to the free paroccipital in the Testudines. If the paroccipital of the Testudines contains 2 elements, as Prof. Cope sees it, then the paroccipital portion of the Squamata

must also contain 2 elements. How then it is possible that the squamosal of the Squamata, can be one of the two elements? The paroccipital has always been a single element from the oldest Fishes and Batrachia up to the Reptilia.

The squamosal of the Squamata (Ophidia, Lacertilia, including Mosasauridæ) is homologous to the squamosal of *Saphæosaurus* (Sauranodon) of the Rhynchocephalia, and of the Ichthyosauria. In all these groups the squamosal is free from the prosquamosal. I have shown that the so-called squamosal of Sphenodon is the homologue of the squamosal plus prosquamosal of the Jurassic Saphæosaurus and the squamosal plus prosquamosal of the Lacertilia. In all other Reptilia, in Birds and Mammals the squamosal is a composit, which is homologous to the squamosal plus prosquamosal of the Stegocephalia, Ichthyosauria, Lacertilia, and Saphæosaurus of the Rhynchocephalia. (Baur G. Bemerkungen über die Osteologie der Schläfengegend der höheren Wirbelthiere. Anat., Anz. X, 1894, pp. 314–330).

I wish Prof. Cope would find the ancestors of the *Testudines*, it would be very important; but for the establishment of the homology of the paroccipital we do not need them; even then the paroccipital will be found to be a single element and not two.

—G. Baur, University of Chicago.

The Food of Some Colorado Birds.—Looking over some old memoranda, I came across the following records of the stomach-contents of birds, which may possibly be worth preserving.

(1.) *Cyanocitta stelleri macrolopha.* Shot Aug. 27, 1889. Willow Creek, Custer Co., Colo. Food, wheat grains and fragments of an insect, not complete enough for identification.

(2.) *Zenaidura macroura.* Shot Aug. 28, 1889. Willow Creek, Custer Co., Colo. Food, a single rather large seed.

(3.) *Canaca obscura.* Willow Creek, Custer Co., Colo. Food: crop containing many berries of *Arctostaphylos uva-ursi*, and some leaves of a different plant; stomach containing seeds; intestine with remains of insects.

(4.) *Falco sparverius.* Shot by Rev. A. Wright, Willow Creek, Custer Co., Colo. Food, stomach full of grasshoppers, apparently *Camnula pellucida* var. *obiona.* The mass was colored red.

(5.) *Falco sparverius.* Shot by Mr. W. P. Lowe at the head of the Big Arroyo, Colo. Food, remains of grasshoppers, and a species of *Anabrus*, identified for me by Prof. L. Bruner as *A. purpurascens.*

(6.) *Tyrannus verticalis* ♂. Shot by Mr. W. P. Lowe, Big Arroyo,

Colo., May 11, 1890. Food, *Euphoria inda*, one specimen, almost whole; *Cicindela* sp., fragments; hymenopterous insects, broken, rather large, thorax black, abdomen red.

(7.) *Pyranga ludoviciana.* ♂. Shot by Mr. P. Lowe, Big Arroyo, Colo., May 14, 1890. Food, fragments of a blow-fly (*Lucilia* or *Calliphora*); fragments of a beetle (perhaps a longicorn); and some green eggs, apparently those of a *Smerinthus*. These eggs were numerous, but I found no fragments of the ♀ moth in which they must have been when eaten.

(8.) *Salpinctus obsoletus*. Shot by Mr. W. P. Lowe, Big Arroyo, Colo., May 14, 1890. Food, fragments of bettles, including a weevil.

(9.) *Geococcyx californianus*, ♂. Shot by Mr. W. P. Lowe, Big Arroyo, Pueblo Co., Colo., Dec. 5, 1889. Food, grasshoppers (*Acrididæ*), *Ophryastes tuberosus* and perhaps another allied species, and a blue-green rugose metallic fragment of an unknown insect.

(10.) *Ampelis garrulus*, ♀. Shot by Mr. W. P. Lowe, Badito, Huerfans Co., Colo. Food, berries of juniper (*Juniperus communis*).

(11.) *Aphelocoma woodhousei*, ♂. Shot by Mr. W. P. Lowe, Badito, Huerfans Co., Colo. Food, fragmentary seeds (papilionaceous?), fragments of bones of a small passerine bird.

(12.) *Merula migratoria*. Cusack Ranch, Custer Co., Colo., April, 1888. Food, seeds and geodephagous beetles.

Mr. Lowe is responsible for the identification of the birds shot by him; he sent me only the stomach-contents.

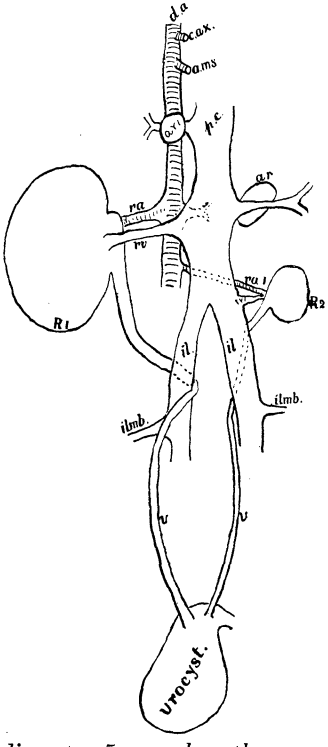
—T. D. A. Cockerell, N. M. Agr. Exp. Sta.

The Manx Cat.—A correspondant of the Zoologist notes an interesting fact concerning a Manx cat in his possession. This tailless cat took of its own accord a mate of the normal type, and from the union resulted a litter of three, which like the mother lacked tails. Friendly relations continued to exist between the parent cats until six successive litters had been produced, each litter in turn showing to a less degree the mother Manx cat's influence upon the form of the progeny, as may be seen in the following table compiled by the owner of the cats.

Litters.	Tailless.	Half tail.	Normal tail.
1	3	0	0
2	2	1	0
3	1	2	0
4	0	2	1
5	0	1	2
6	0	0	3

It would be interesting to carry the experiment further and see if a union of the Manx cat with one of her own race would result in restoring with the same regularity with which she lost it, the power to produce her own type. (Revue Scientif. T. 4, 1895.)

A case of Renal Abnormality in the Cat.—Anomalous condition of the renal organs and accompanying blood vessels was recently disclosed in a dissection in this laboratory. The accompanying diagram explains the phenomenon. The left kidney was a miniature of the right though functional. The dimensions of the right kidney in another subject of equal size as the specimen under discussion were found to be—length 3 cm., width 2 cm. and dorso-ventral thickness 15 mm.; the left os is natural being slightly smaller than this. The dimensions just given may be regarded as normal.



In the subject whose renal anatomy has been here figured, the measurements of the right kidney were as follows: length 4 cm. breadth 2½ cm. and thickness (dorso-ventral) 19 mm., considerably above the normal as one would expect when the extremely small size of the left kidney is considered. The dimensions of the latter were as follows: length 12 mm., breadth 8 mm., and thickness or dorsoventral diameter 5 mm., less than one-third the dimensions of the right kidney.

Upon hardening, staining and sectioning in the usual way the glomeruli and uriniferous tubules were found to be normal though, the presence of a small amount of fat in the kidney was noted. The histological condition of the kidney and the presence of the left ureter, which, though smaller than the right was clearly functional, proved that the left kidney was of value in the vegetative processes of the organism. The right renal artery (*ra*) was, as one would expect larger than the left (*ra*). The postcava (*pc*) in this cat was divided very far forward in the lumbar region to form the common iliac veins, causing the left

renal vein (*rvi*) to empty into the left common iliac. This variation from the normal in postcaval structure is by no means uncommon.

Letters in the figure, not referred to in the text are as follows: *da.* dorsal aorta, *cax.* cœliar axis, *a. m. s.* anterior mesenteric artery, *rv.* vein from right kidney, R_1. right kidney, R_2. left kidney, *ar.* and *ari.* left and right adrenal bodies with accompanying veins. *Il* left and right common iliacs, *ilmb.* ilio-lumbar veins *u* ureters, *urocyst* urinary bladder.—F. L. WASHBURN, Biological Laboratory, University of Oregon.

Zoological News.—Mr. O. F. Cook has published a monograph of Scytonotus. He considers this genus to be the most specialized of the Polydesmid Myriapoda, basing his conclusion on its secondary sexual characters. He recognizes nine species as belonging to the genus. (Ann. New York, Acad. Sci., VIII).

A gigantic Cephalopod, supposed to be a new species of Architeuthis, was driven inshore on the eastern side of the bay of Tokyo. A description of it, illustrated with drawings, is published by K. Mitsukuri and S. Ikeda. It is characterized by shape of its fins and of its beaks, the unequal lengths of the sessile arms, and other minor details. (Zool. Mag., Vol. VII, 1895).

Prof. Gegenbaur has in the Morphologisches Jahrbuch for the year 1895, instituted a study of the clavicle and the elements adjacent to it and the scapular arch. He calls attention to the fact that there are two elements in the position of the former in Dipnoi, Crosopterygia and Chondrostei. He then shows that the element nearest the scapula is retained in some of the Stegocephalia, while the anterior and distal element is increased in length. He calls the former the cleithrum, and retains for the latter the name clavicle. The clavicle only remains in the existing order of Batrachia, and higher groups, while the cleithrum only remains in the higher fishes, beginning with Lepidosteus and Amia.

According to Dr. Delisle the cranial capacity of the Orang-Outang averages 408 cubic centimeters. (L'Anthropologie Tome, VI, 1895.)

Ranke's researches show that the weight of the human brain is much greater in proportion to the weight of the spinal cord than in any other vertebrate. (Correspondenzblatte).

Dr. E. Rosenberg publishes in the Morphologisches Jahrbuch for 1895, an investigation into the reduction of the number of the incisor teeth which is seen in the human species. He shows: first, that the loss of

the external incisor, which was first pointed out by Cope, and which has been observed independently by several others, is frequently observed in Europe as well as in America; second, that the loss of the first inferior incisor is also not very uncommon in Europe and that the final reduction of the inferior incisors, should it take place, will be by the loss of this tooth and not by that of the external incisor as in the superior series. He, therefore, believes that the ultimate formula of the incisive dentition in man will be $I\frac{1}{1}$, and not $I\frac{1}{2}$, as Cope left it.

ENTOMOLOGY.[1]

The Segmental Sclerites of Spirobolus.—The structure of the segments of Diplopoda has long been a morphological puzzle. On account of the possession of two pairs of legs they have in a general way been supposed to be double segments, that is, formed by the coalescence of two distinct embryonic or theoretical segments. Toward a morphological demonstration of this idea there has been little progress. Indeed, there are many facts which give grounds of suspicion as to its correctness. Among these may be noticed that the double-footed state does not occur in the embryo at all, and that the segments which in the adult bear two pairs of legs either do not exist in the newly hatched larva or do not bear any legs at that stage, the newly hatched diplopod larva having but three pairs of legs, the posterior of which is attached to the fourth segment (at least in the Polydesmoidea). Moreover, all Diplopoda have apodous segments not differing otherwise from those which bear legs; also all Diplopoda have segments which bear but one pair of legs, and yet have not been found to be greatly different from the others. Growing Diplopoda acquire segments by intercalation in front of the last. The segment is added at one moult, the legs for it at the next. As the possession of two pairs of legs has been the occasion of the theories of duplex segments, these facts are the more relevant as objections, since more difficulties are introduced than are disposed of by the theories.

The existence of pluræ in the Oniscomorpha has long been known, and for a less period in the Colobognatha and Limacomorpha. In the other orders these elements of the segmental ring are so thoroughly coalesced or eliminated that their existence was theoretical until their

[1] Edited by Clarence M. Weed, New Hampshire College, Durham, N. H.